



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,451	05/26/2006	Carole Baubet	283429US0PCT	3499
22850	7590	04/10/2009		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
MCDONALD, RODNEY GLENN				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
04/10/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary

Application No.

10/562,451

Applicant(s)

BAUBET ET AL.

Examiner

Rodney G. McDonald

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 1-18 and 31-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 2-19-09
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 19-22, 24-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lerbet et al. (U.S. Pat. 5,569,362) in view of Scobey et al. (U.S. Pat. 4,851,095) and Nakanishi et al. (U.S. Pat. 6,033,471) or Veerasamy (U.S. Pat. 6,596,399).

Regarding claim 19, Lerbet et al. teach a process for deposition on a substrate comprising depositing at least one dielectric film layer on the substrate by sputtering in a sputtering chamber with exposure to at least one ion beam coming from an ion source and wherein the refractive index of the dielectric layer exposed to the ion beam can be

adjusted to parameters of the ion source. (Column 2 lines 13-20; Column 5 lines 25-48; Column 2 lines 50-51)

Regarding claim 20, Lerbet et al. an oxygen ion beam is created. (Column 5 lines 35-40; Column 3 lines 44-50)

Regarding claim 21, Lerbet et al. teach the energy of the ion beam can be less than or equal to 500 eV. (Column 3 lines 58-62)

Regarding claim 22, Lerbet et al. teach the density of the dielectric layer is preserved. (Column 2 lines 49-48)

Regarding claim 24, Lerbet et al. teach the refractive index of the dielectric layer is increased. (Column 2 lines 50-51)

Regarding claim 25, Lerbet et al. teach the exposure to an ion beam takes place simultaneously with the deposition of the layer by sputtering. (Column 3 lines 4-5)

Regarding claim 26, Lerbet et al. teach the exposure to an ion beam takes place sequentially after the layer has been deposited by sputtering. (Column 3 lines 18-20)

Regarding claim 27, Lerbet et al. teach directing the ion beam onto the substrate. (Column 5 lines 25-49)

Regarding claim 29, Lerbet et al. teach the dielectric layer can be zinc oxide. (Column 4 line 1)

The difference between Lerbet et al. and the present claims is that the ion beam being created by a linear ion source is not discussed (Claim 19) and the parameters of the ion source are modification of the angle between the ion beam and the surface of the substrate and/or modification of the voltage applied to the ionic source (Claim 19).

Regarding the use of a linear ion source (claim 19), Scobey et al. teach utilizing a linear ion source for sequentially deposition and treating of substrates. (See Abstract; Column 8 lines 34-68; Column 9 lines 1-68; Column 10 lines 1-2)

The motivation for utilizing a linear ion source is that it allows upward scaling capability. (Column 9 lines 64-65)

Regarding the parameters of the ion source being modification of the angle between the ion beam and the surface of the substrate (Claim 19), Nakanishi et al. teach that the angle of the assist ion beam should be from 0 to 45 degrees. (Column 3 lines 15-20)

The motivation for utilizing the features of Nakanishi et al. is that it allows providing enough energy for the ions to bombard the atoms of the thin film. (Column 3 lines 15-20)

Regarding the parameters of the ion source being the modification of the voltage applied to the ion source (Claim 19), Veerasamy teaches controlling the voltage of a linear ion source to control the energies of the ions eV. The energies of the ions eV is about 1/2 the Voltage. (Column 6 lines 4-25)

The motivation for utilizing the features of Veerasamy is that it allows for controlling properties of the film. (Column 4 lines 52-57)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Lerbet et al. by utilizing the features of Scobey et al. and the features of Nakanishi et al. or Veerasamy because it allows for

upward scaling capability, controlling the energy bombarding the films and for controlling the properties of the films.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lerbet et al. in view of Scobey et al. and Nakanishi et al. or Veerasamy as applied to claims 19-22, 24-27 and 29 above, and further in view of Gregory et al. (U.S. Pat. 4,691,077).

The difference not yet discussed is the lowering of the index of refraction be exposure to an ion beam. (Claim 23)

Regarding claim 23, Gregory et al. teach lowering the refractive index by ion beam treating according to selection of the ion gas. (Column 2 lines 5-15)

The motivation for lowering the refractive index is that it allows for control of the index of refraction. (Column 2 lines 5-15)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Gregory et al. because it allows for control of the index of refraction.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lerbet et al. in view of Scobey et al. and Nakanishi et al. or Veerasamy as applied to claims 19-22, 24-27 and 29 above, and further in view of Wei (U.S. Pat. 6,190,511).

The difference not yet discussed is directing an ion beam onto at least one of the cathodes. (Claim 28)

Regarding claim 28, Wei teach directing an ion beam onto a target cathode of a sputtering cathode. (Column 4 lines 11-28) An assist ion beam can treat the coated substrate. (Column 6 lines 15-17)

The motivation for directing an ion beam onto at least one cathode is that it allows for sputtering of the cathode. (Column 4 lines 11-18)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Wei because it allows for sputtering the cathode.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lerbet et al. in view of Scobey et al. and Nakanishi et al. or Veerasamy as applied to claims 19-22, 24-27 and 29 above, and further in view of Reade et al. (U.S. Pat. 6,809,066).

The difference not yet discussed is that treating the deposited layer with an additional treatment with at least one other ion beam is not discussed (Claim 30).

Regarding claim 30, Reade et al. teach depositing a buffer layer by utilizing ion beam assisted deposition. (Column 3 lines 13-19) The buffer layer deposition can occur by sputtering. (Column 14 lines 15-19) The buffer layer can be MgO. (Column 12 lines 61-62) The buffer layer can then be textured by ion beams. (Column 3 lines 36-46) Multiple beams can be used in sequence for the texturing. (Column 4 lines 5-10)

The motivation for performing an additional ion beam treatment step is that it allows for increasing the degree of texture of the surface. (Column 3 line 40)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Reade et al. because it allows for increasing the degree of texture for the surface.

Response to Arguments

Applicant's arguments filed December 18, 2008 have been fully considered but they are not persuasive.

The obviousness type double patenting rejection has been overcome since claims 16-28 have been canceled in copending application 10/562,121.

In response to the argument that the prior art does not teach modification of the angle between the ion beam and the surface of the substrate and/or modification of the voltage applied to the ionic source which allow the variation of the index of the layer, it is argued that Lerbet et al. teach changing the refractive index of a layer by selecting the eV of an ion beam. Lerbet et al. show the treatment occurring in a single chamber. Lerbet et al. select the eV to be less than or equal to 500 eV. (See Lerbet et al. Example 1; Fig. 5; Lerbet et al. discussed above) Veerasamy teaches that the eV of an ion beam is related to the applied voltage. (See Veerasamy discussed above) Therefore one of ordinary skill in the art would readily envisage controlling the voltage of the ion beam source to control the eV of the ions. Furthermore, Nakanishi et al. suggest controlling the angle of the ion beam to control the energy of the bombarding ions. (See Nakanishi et al. discussed above)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

RM
April 7, 2009